CLOSURE REPORT AND SITE ASSESSMENT

FOR

UNDERGROUND PETROLEUM STORAGE TANKS

NORTH SUMMIT SQUARE DEVELOPMENT

FORSYTH COUNTY, NORTH CAROLINA

PREPARED FOR

BNE LAND & DEVELOPMENT COMPANY

JULY 1991

PREPARED BY

S&EC

Soil & Environmental Consultants, Inc.
1125 Cedarhurst
Raleigh, North Carolina 27609

S&EC

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Introduction

Soil and Environmental Consultants, Inc. (S&EC) was employed by BNE Land Development Corporation to provide technical supervision and guidance for the closure of four underground storage tanks on the Corporation's property in Forsyth County, North Carolina. The property on which the tanks were located is to become part of the proposed North Summit Square Shopping Center. It is located in Stanleyville, North Carolina just north-east of the intersection of U.S. 52 and University Parkway (see figure 1). The tanks were noted during a phase I environmental assessment on the property prepared by S&EC in April, 1991. S&EC recommended in that report that the tanks be closed in accordance with North Carolina regulations related to the proper closure of underground storage tanks to be discontinued from service. Notice of Intent (Subchapter 2N, Title 15A, NCAC) form GW/UST-3 was filed with the Winston-Salem Regional Office of the N.C. Division of Environmental Management on 5/17/91.

Three of the tanks (see figure 2) were located at the former site of Interstate Trucking Company, a truck sales and repair business. A fourth tank was located adjacent to a private residence (see Figure 3). It was originally used to store heating oil for the residence but was later converted to store heating fuel for a

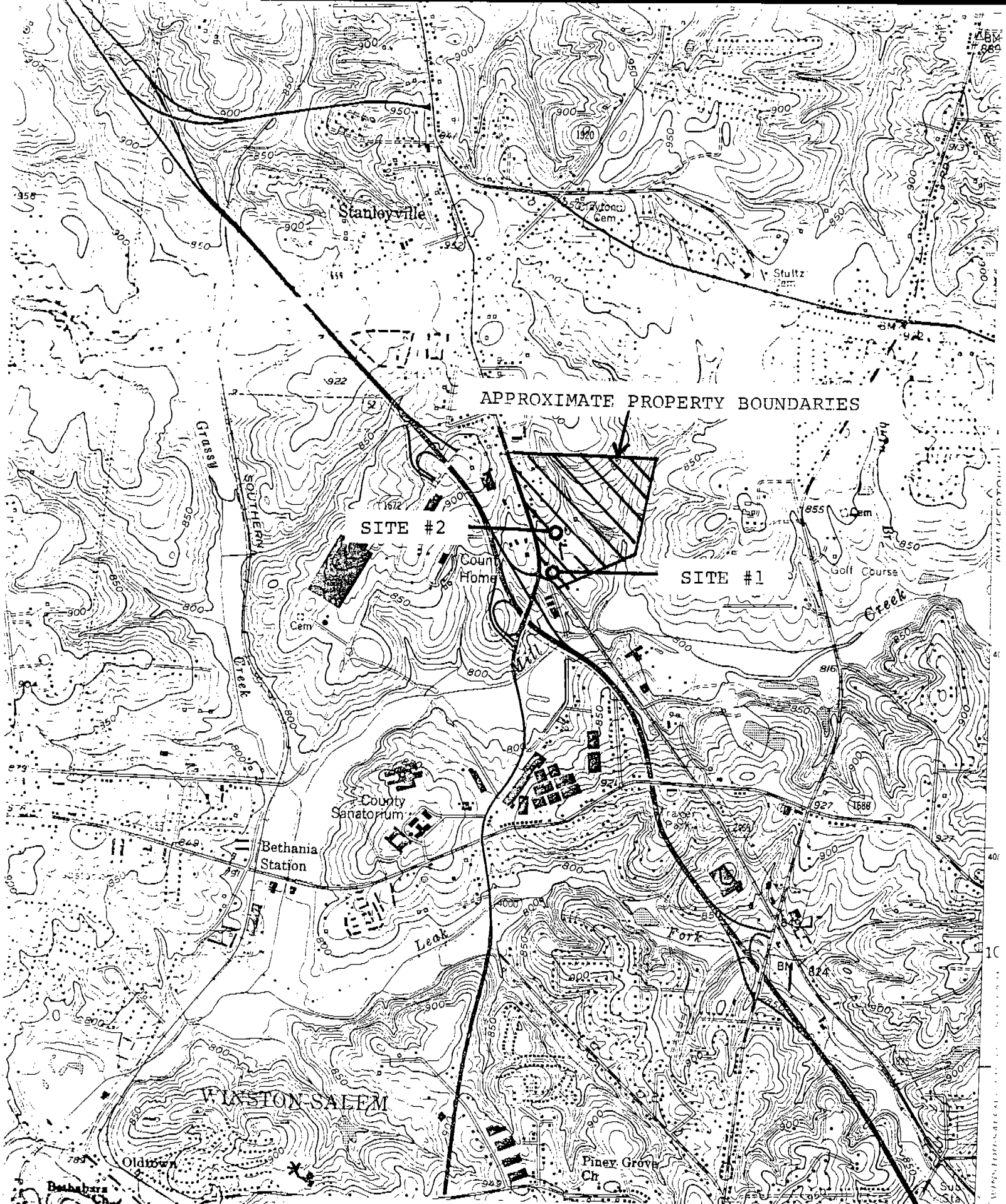


FIGURE 1. - GENERAL LOCATION - NORTH SUMMIT SQUARE PROPERTY

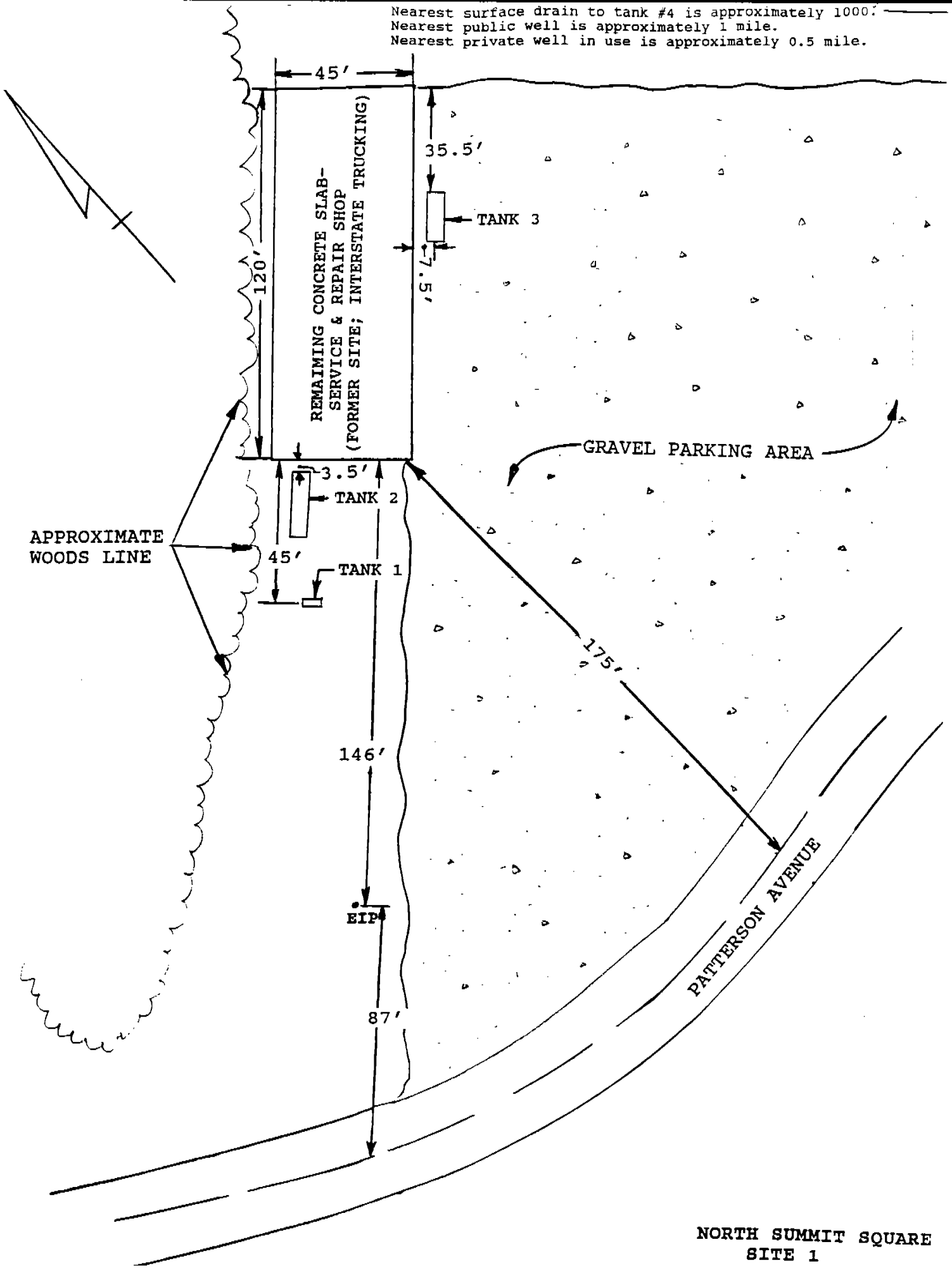


Figure 2.0 Approximate Location of Tanks at Former Site of Interstate Trucking Company

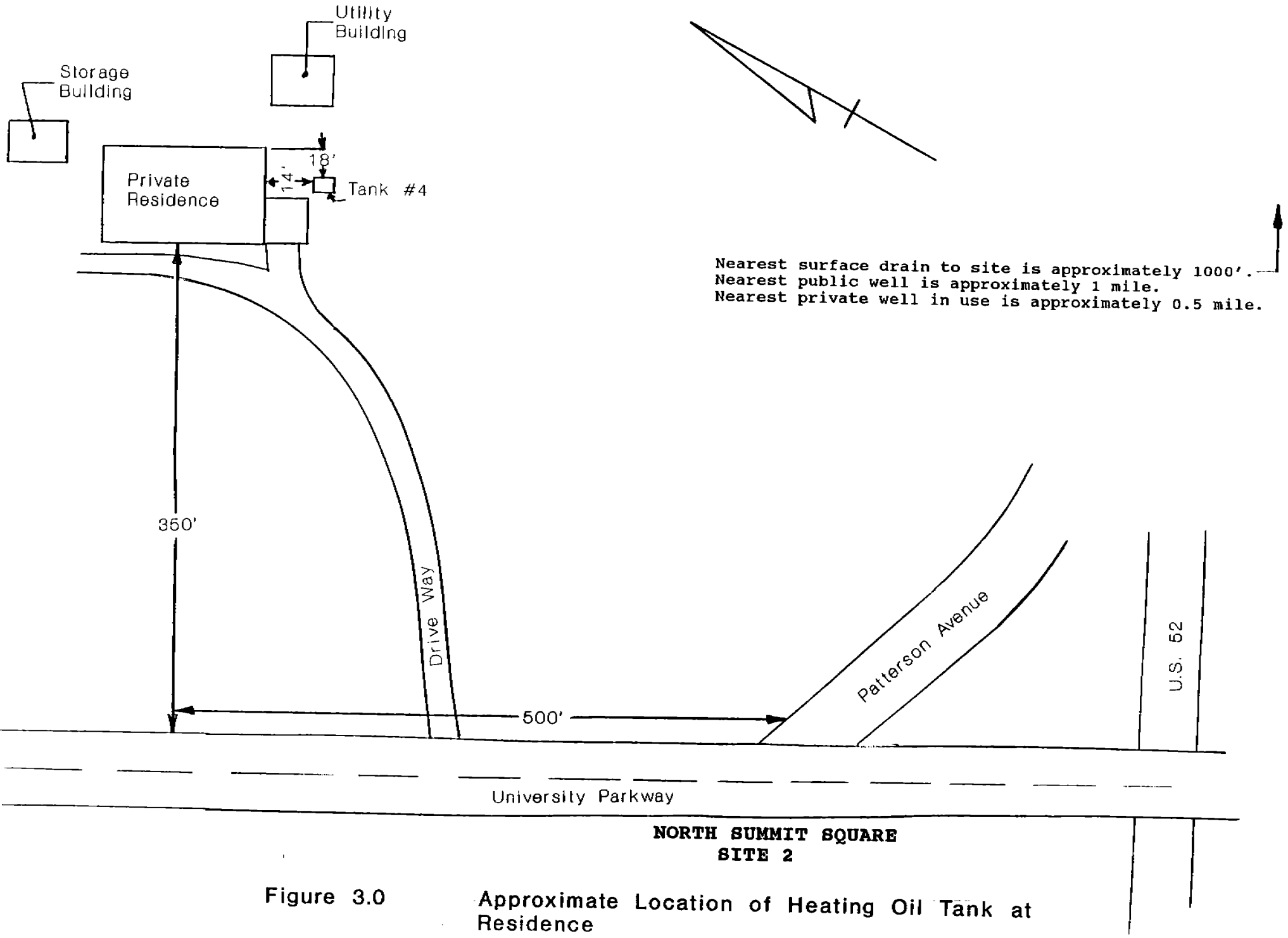


Figure 3.0 Approximate Location of Heating Oil Tank at Residence

small motel formerly located on the property. S&EC was unable to find any evidence the tanks had ever been registered with the N.C. Division of Environmental Management.

Joyner Wrecking and Grading Company of Winston-Salem was employed by the property owners for removal and disposal of the tanks. Four Seasons Inc. in Greensboro pumped out and disposed of residual liquids in the tanks and also provided tank cleaning and disposal services.

The purpose of this report is to provide a summary of the tank removal process, site assessment activities by S&EC, and to serve as a closure document to be provided the N.C. Division of Environmental Management. Form GW-UST-2 (Site Investigation Report for Permanent Closure of UST) is attached to this report as Appendix B.

II. Description of Tanks

Three of the four tanks removed were located at the former site of Interstate Trucking Company and were used in connection with that business. These tanks had been out of service for approximately two years. The fourth tank was located at a private residence and

was originally used to store heating fuel for the residence. Later it was converted to store heating oil for a small motel. It had been out of service for several years. Table I provides a description of each tank. S&EC was unable to determine exact dates of installation of the tanks. However, based on conversations with the property owners it is believed the tanks 1, 2, and 3 were installed were installed in the early 1980's. Tank #4 was probably installed in the 1950's.

III. Tank Removal Process and Site Assessment

Removal of the tanks began on June 19, 1991 and was completed on June 20, 1991. Joyner Wrecking and Grading Company, Inc. provided a backhoe and other equipment needed for removal of the tanks. S&EC was on site to provide technical supervision and to perform site assessments. Four Seasons, Inc. used several tanker trucks during these two days to pump out residual contents from the tanks.

Tank #1 was a small gasoline tank of approximately 250 gallons (see site photo 1). It was almost full of a water/gasoline mixture which was removed by Four Seasons. The tank was dented on top and had a small tear in the top which appeared to have been

TABLE I. Description of Tanks Removed from Proposed North Summit Square Property

Tank #	Length	Diameter	Nominal Volume	Material	Coating	Depth of Bury	Last Contents
1	5'0"	3'0"	250 gal.	steel	asphaltic	0.5'	gasoline
2	22'10"	5'6"	4000 gal.	steel	asphaltic	1.0'	waste oil
3	16'6"	6'6"	4250 gal.	steel	asphaltic	3.1'	diesel fuel
4	12'0"	5'4"	2000 gal.	steel	unknown	3.5'	heating fuel

made by a backhoe bucket tooth. This probably occurred during what appeared to be a previous attempt by someone to uncover and locate the tanks on site. As excavation began S&EC personnel noted a strong gasoline odor in the soil. The soil was also scanned with a Photovac Microtip photoionization detector (PID). Elevated readings were observed on this instrument. The PID senses vapors coming off most petroleum products and was used in the field as an indicator of the possible presence of petroleum product in the soil. Excavated soil which had gasoline odors or which exhibited elevated PID readings was placed on plastic pending lab tests and a final decision on disposition. S&EC monitored excavation constantly with the PID and removal of potentially contaminated soil continued until all areas of the tank bed exhibited zero readings on the PID. Soil samples were collected at locations shown on Figure 4 to verify the removal of all contaminated soil. Samples were immediately stored in a cooler on ice until they could be transported to the lab. All samples were collected with decontaminated stainless steel spoons and placed in laboratory furnished bottles and vials. No groundwater was observed at any time during the excavation of the tank. S&EC did some further hand augering and estimated ground water to be in excess of 7′ below the bottom limits of excavation. The final limits of excavation are also shown on figure 4. Except

for the tear in the top of this tank S&EC observed no other holes or obvious signs of leakage from this tank. No lines were attached to the tank or observed during the tank removal. Laboratory results (see Appendix A and Figure 4) confirm the removal of all contaminated soil. Approximately 13 cubic yards of contaminated soil was removed from around tank #1.

Tank #2 was a waste oil tank of approximately 4000 gallons (see site photo 2). It was located approximately 3' from the end of the truck service/ repair building. According to the owner this tank stored waste oil which was used to fuel the furnace for the building. On June 19 it was approximately one-third full (1200-1400 gallons) of a liquid which appeared to be primarily waste oil. The contents were removed by Four Season, Inc. S&EC constantly scanned soil removed from around this tank with the PID as excavation progressed. When the tank was removed S&EC visually observed and scanned with the PID all areas of the tank bed. There were no obvious signs of leakage or spills from this tank and no elevated PID readings were observed. No soil staining or soil with petroleum odors was observed. Samples were collected and stored as described above at locations shown on Figure 4. S&EC carefully inspected the tank after its removal and found it to be in excellent condition with virtually no corrosion and an

intact asphaltic coating.

Tank #3 was a diesel fuel tank of approximately 4250 gallons also located immediately adjacent to the truck service/repair building (see site photo 3). The pump for this tank apparently was located immediately over the top of the tank. S&EC found soil around the fill pipe with a strong odor resembling diesel fuel. It is likely there had been surface spillage around the pump in the past. The tank was approximately one-half full of a product which appeared to be primarily diesel fuel. Contents were removed by Four Seasons. As excavation of the tank progressed all soil which had diesel fuel odors and/or exhibited elevated PID readings was placed on plastic pending lab test and a final decision on disposition. When the tank was removed all areas of the tank bed were scanned with the PID. Elevated readings were also observed immediately below the drain plug end of the tank. Observation of the tank revealed that some leakage had probably occurred from around the drain plug. The plug and fitting were in excellent condition, however, with practically no corrosion. It is likely the leakage was due to a loose plug. Excavation of the contaminated soil continued until zero readings were obtained on the PID at all locations in the tank bed. Approximately 115 cubic yards of contaminated soil were removed from around and

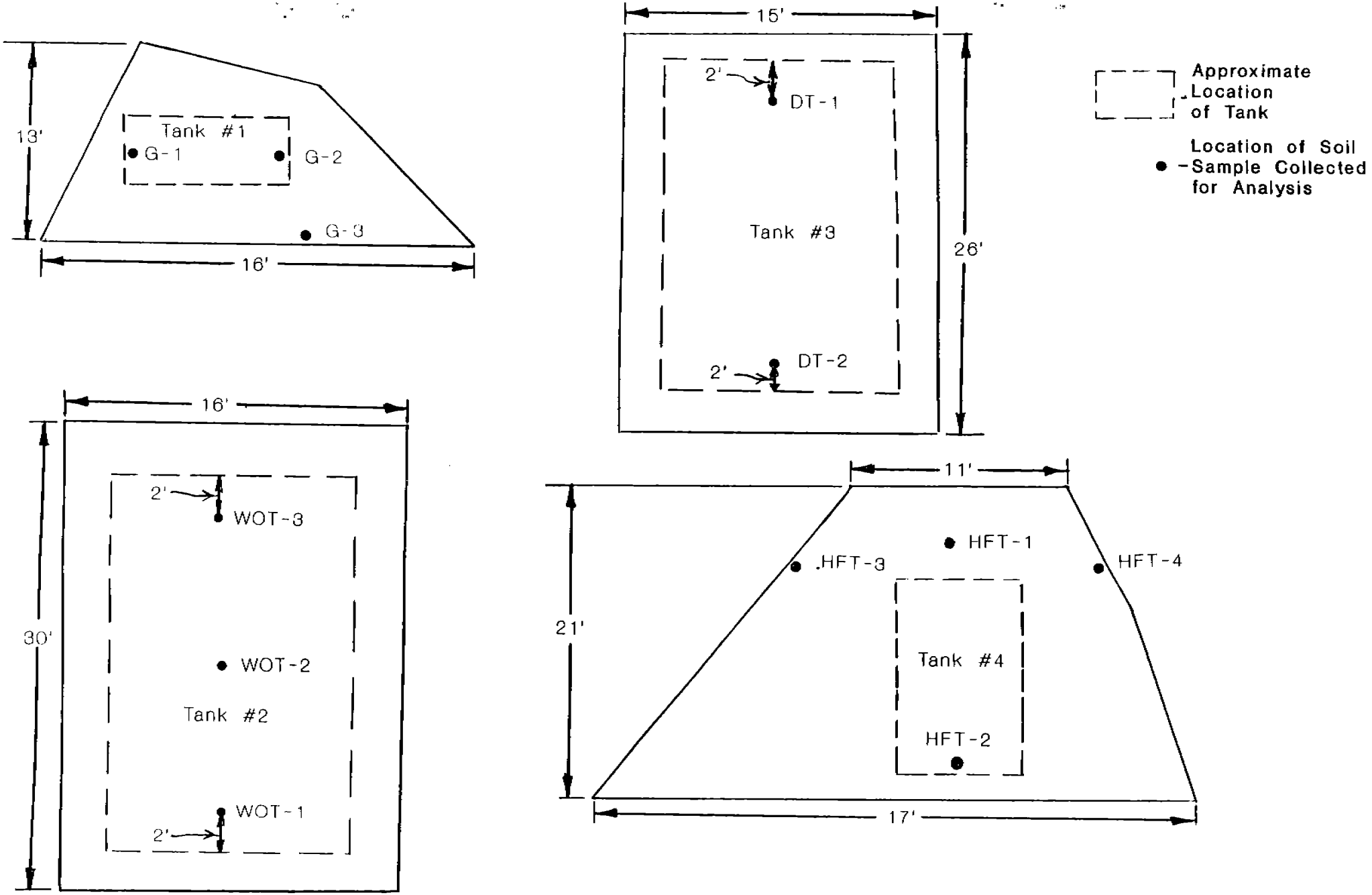


Figure 4.0 **Final Excavation Limits and Sample Locations**

immediately underneath this tank. Samples were collected and stored as previously described and as shown on Figure 4. S&EC carefully examined the tank after excavation and found it to be in very good condition. The asphaltic coating was still almost completely intact. There were no signs of leakage from the tank, except for the drain plug as previously noted. No groundwater was observed in the excavation at any time. Depth to groundwater was estimated at 7'+ below the lower limit of excavation.

Tank #4 was a 2000 gallon heating oil tank located adjacent to a private residence (see site photo 4). According to the previous property owner it had been out of service several years. This tank was completely full of what appeared to be primarily water with an oily sheen. Contents were removed by Four Seasons for proper disposal through their permitted process (see site photos 5 and 6). No soils with odors or elevated PID readings were observed as the initial excavation of soil from around this tank took place. However, as excavation reached the midpoint of the tanks soil was encountered at one end with strong petroleum odors. As excavation of this contaminated soil took place it was placed on heavy plastic. S&EC constantly monitored excavated soils and found most of the soil from the midpoint of the tank down to be contaminated. After the tank was removed S&EC monitored the tank

bed and identified areas with elevated PID readings. The area of excavation was expanded horizontally and vertically until zero instrument readings were observed when scanning the floor and sidewalls of the excavated area. Samples were collected and stored as previously stated. Figure 4 shows the final limits of excavation and the location of samples taken. Approximately 145 cubic yards of contaminated soil was removed at this site. Groundwater was not encountered during the excavation. This tank was on a high knoll. Observation of ground water in an abandoned well on the property in a similar setting indicates that groundwater could be expected at about 25 feet below land surface at the tank site. This tank was examined by S&EC upon removal. It was found to be in very poor condition with numerous pitting and scaling. A hole approximately the size of a dime was observed in the bottom of the tank at one end. This was in fact the end of the tank where the largest amount of contamination was observed. Two samples collected from the final excavation exhibited TPH concentrations of 10 ppm and 22 ppm. S&EC believes any remaining soil contamination is minor and of very limited extent however. The PID readings were zero at both locations where these samples were taken. The final limits of excavation represented about the maximum reach limits for the backhoe, given the proximity of the house (see site photos 7 and 8). S&EC recommends the State review

the Site Sensitivity Evaluation for this site (see Appendix C) and if appropriate concur with closing this site as is with no further work.

Laboratory Testing

All soil samples were collected from 9:00 a.m. to 3:00 p.m. on June 20, 1991 using a decontaminated stainless steel spoon for each sample. Soil was placed in glass containers supplied by Webb Technical Group, Incorporated in Raleigh, North Carolina. Immediately after collection the samples were placed in a cooler on ice. They remained on ice until they were delivered to Webb Technical for analysis early on June 21, 1991. The laboratory reports on each sample are included as Appendix A to this report. Sample numbers correspond to sampling points as indicated on Figure 4. Table II provides a summary of information about soil samples collected.

Conclusions and Recommendations

The four tanks described in this report have been removed and properly closed. Contaminated soil was discovered at three of the tank sites and was completely excavated as best S&EC could determine with the excavation of some minor remaining contamination at the site of tank #4. Because of the proximity of

TABLE II. Summary of Information on Soil Samples Collected for Analysis

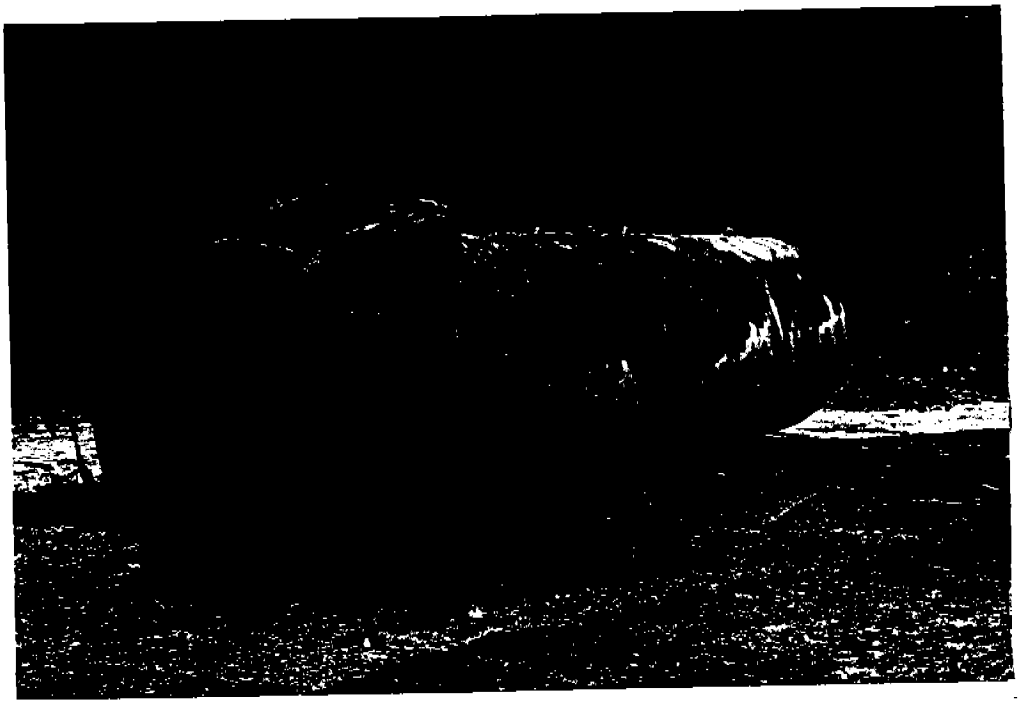
Sample #	Tank #	Location	Depth Below Ground	PID Reading	Lab Test Method	Results
G-1	1	Excavation Floor	9.7′	0	SW 846-5030	<10ppm TPH
G-2	1	Excavation Floor	11.2′	0	SW 846-5030	<10ppm TPH
G-3	1	Excavation Sidewall	9.0′	0	SW 846-5030	<10ppm TPH
WOT-1	2	Excavation Floor	9.7′	0	SW 846-3550	<10ppm TPH
WOT-2	2	Excavation Floor	8.0′	0	SW 846-3550	<10ppm TPH
WOT-3	2	Excavation Floor	8.7′	0	SW 846-3550	<10ppm TPH
DT-1	3	Excavation Floor	13.0′	0	SW 846-3550	<10ppm TPH
DT-2	3	Excavation Floor	12.0′	0	SW 846-3550	<10ppm TPH
HFT-1	4	Excavation Floor	15.0′	0	SW 846-3550	<10ppm TPH
HFT-2	4	Excavation Floor	10.0′	0	SW 846-3550	22ppm TPH
HFT-3	4	Excavation Sidewall	11.0′	0	SW 846-3550	10ppm TPH
HFT-4	4	Excavation Sidewall	11.5′	0	SW 846-3550	<10ppm TPH

the residence and the difficulty of any further excavation, S&EC recommends the State be requested to review the Site Sensitivity Evaluation (Appendix C) and concur in no further action at this site if appropriate.

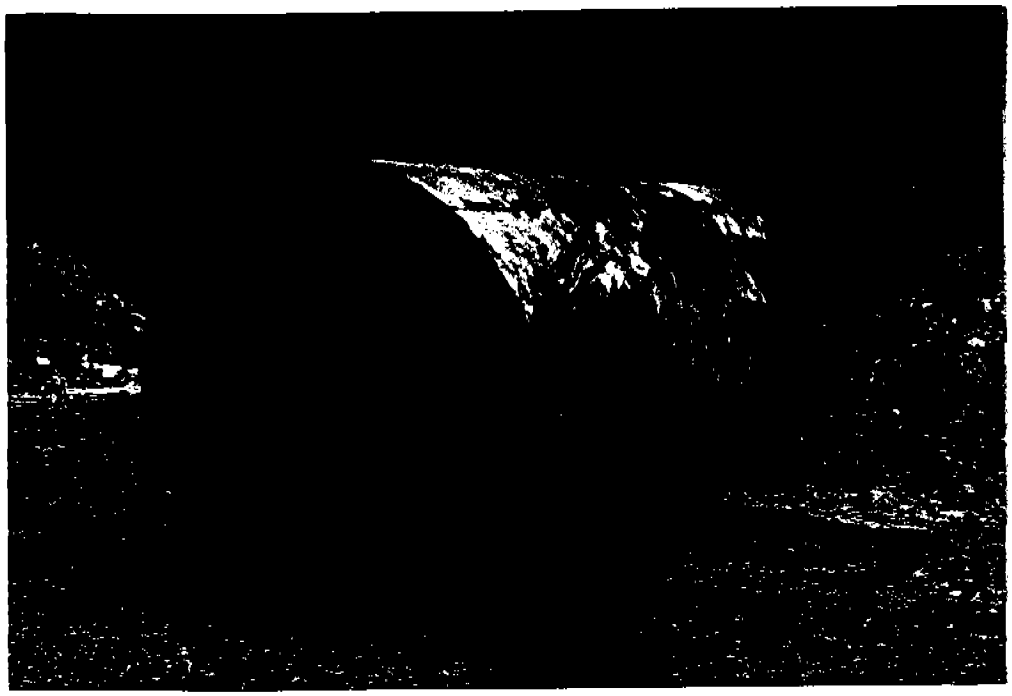
Approximately 300 cubic yards of contaminated soil remain on the site. This soil is on plastic and is covered by plastic to prevent runoff. Negotiations are currently underway with Cunningham Brick Company for disposition of this soil through their thermal treatment process. The property owners are also considering the option of remediating the soil through land application. All contaminated soil will be treated by one of these methods within 30 days.

SITE PHOTOGRAPHS

Site Photo 1 - Tank #1



Site Photo 2 - Tank #2



Site Photo 3 - Tank #3

Site Photo 4 - Tank #4

Site Photo 5 - Removal of Residual Tank Contents by Four Seasons - Tank #3

Site Photo 6 - Removal of Residual Contents by Four Seasons - Tank #3

Site Photo 7 - Location of Tank #4
Note Proximity to
Residence

Site Photo 8 - Excavation of
Tank #4

APPENDICES

APPENDIX A - Laboratory Results on Soil Samples and Copy of Chain of Custody

APPENDIX B - GW/UST-2 Site Investigation Report for Permanent Closure of U.S.T.

APPENDIX C - Site Sensitivity Evaluation - Site 2

Page 1 **Webb Technical** **REPORT** **Work Order # 91-06-649**
Received: 06/21/91 **07/03/91 15:11:05**

REPORT TO: SOIL AND ENVIRONMENTAL CONSULTANTS
1125 CEDARHURST DR.
RALEIGH, NC 27609
ATTEN: JIM BEESON/JUDY REAGAN

CLIENT: SOILEN SAMPLES: 18
COMPANY: SOIL AND ENVIRONMENTAL
FACILITY: CONSULTANTS

WORK ID: TPH
TAKEN: NORTH SUMMIT WINSTON-SALEM
TRANS: DELIVERY, CLIENT
TYPE: SOIL/SLUDGE
P.O. #:
INVOICE: under separate cover

PREPARED BY: Webb Technical Group, Inc.
4320 Delta Lake Drive
Raleigh, NC 27612

CERTIFIED BY

ATTEN: Client Services
PHONE: (919)787-9171

CONTACT: G_FLYNT

We are pleased to provide this certified report of analysis.
Samples will be retained for 30 days after report is issued.
Feel free to telephone if further explanation is required.
Refer to the Work Order # in all correspondence.

SAMPLE IDENTIFICATION

01	WOT 1 6/20/91
02	WOT 2 6/20/91
03	WOT 3 6/20/91
04	DT 1 6/20/91
05	DT 2 6/20/91
06	DT 3 6/20/91
07	HFT 1 6/20/91
08	HFT 2 6/20/91
09	HFT 3 6/20/91
10	HFT 4 6/20/91
11	COMP 1 SPOIL PILE DT 6/20
12	COMP 2 SPOIL PILE DT 6/20
13	COMP 3 2ND SPOIL/SLAB 6/20
14	HFT SPOIL PILE COMP 6/20
15	G-1 6/20/91
16	G-2 6/20/91
17	G-3 6/20/91
18	GAS TANK SPOIL PILE COMP

TEST CODES and NAMES used on this workorder

TPH_DS	TPH IN SOIL FOR DIESEL
TPH_GS	TPH IN SOIL FOR GASOLINE

SAMPLE ID **HFT 1 6/20/91** SAMPLE # **07** FRACTIONS: **A**
Date & Time Collected **06/20/91** Category

TPH_DS **<10** PPM

SAMPLE ID **HFT 2 6/20/91** SAMPLE # **08** FRACTIONS: **A**
Date & Time Collected **06/20/91** Category

TPH_DS **22** PPM

SAMPLE ID **HFT 3 6/20/91** SAMPLE # **09** FRACTIONS: **A**
Date & Time Collected **06/20/91** Category

TPH_DS **<10** PPM

SAMPLE ID **HFT 4 6/20/91** SAMPLE # **10** FRACTIONS: **A**
Date & Time Collected **06/20/91** Category

TPH_DS **<10** PPM

SAMPLE ID **COMP 1 SPOIL PILE DT 6/20** SAMPLE # **11** FRACTIONS: **A**
Date & Time Collected **06/20/91** Category

TPH_DS **155** PPM

SAMPLE ID **COMP 2 SPOIL PILE DT 6/20** SAMPLE # **12** FRACTIONS: **A**
Date & Time Collected **06/20/91** Category

TPH_DS **199** PPM

Webb Technical REPORT
Results by Sample

Work Order # 91-06-649

SAMPLE ID **COMP 3 2ND SPOIL/SLAB 6/20** SAMPLE # **13** FRACTIONS: **A**
Date & Time Collected **06/20/91** Category

TPH_DS **557** PPM

SAMPLE ID **HFT SPOIL PILE COMP 6/20** SAMPLE # **14** FRACTIONS: **A**
Date & Time Collected **06/20/91** Category

TPH_DS **40** PPM

SAMPLE ID **G-1 6/20/91** SAMPLE # **15** FRACTIONS: **A**
Date & Time Collected **06/20/91** Category

TPH_GS **<10** PPM

SAMPLE ID **G-2 6/20/91** SAMPLE # **16** FRACTIONS: **A**
Date & Time Collected **06/20/91** Category

TPH_GS **<10** PPM

SAMPLE ID **G-3 6/20/91** SAMPLE # **17** FRACTIONS: **A**
Date & Time Collected **06/20/91** Category

TPH_GS **<10** PPM

SAMPLE ID **GAS TANK SPOIL PILE COMP** SAMPLE # **18** FRACTIONS: **A**
Date & Time Collected **06/20/91** Category

TPH_GS **79** PPM

WEBB TECHNICAL GROUP, INC
4320 Delta Lake Drive • Raleigh, North Carolina 27612
(919) 787-3061/(800) 548-7687
Sample Collection, Shipment, and Receipt Form

Client Soil + Environmental Consultants PO# _____

Contact Don Wells Date Delivered 6 / 21 /90 Time 8 : 45 ~~AM~~ PM

Address 1125 Cedarhurst Drive 27609 Phone ( ) _____

City Raleigh County Wake State _____ Zip _____

Sample Name (√) ___ Groundwater ___ Well Water ___ Drinking Water ___ Wastewater

✓ Soil ___ Oil ___ Hazardous Material ___ Radioactive Material

___ Food - Type _____ ___ Other _____

NPDES Number _____ Pipe Number _____ % Effluent _____ Sample Type (√) ___ Grab ___ Composite

Sampling Location North Summit Winston Salem

Type of Process Generating Waste _____

Sampling Started: Date: 6 /20 /90 Time: 10 : 00 ~~AM~~ PM
Sampling Ended: Date: 6 / 20 /90 Time: 5 : 00 AM ~~PM~~
Sampling Intervals: ____/____ Hrs.

Was Sample Collected Chilled? (Yes) No
Was Sample Shipped Chilled? (Yes) No

Number of Samples 18 Number of Containers (bottles/bags) 21

Sample ID _____

Type of Analysis(es) Required on Sample(s) _____

TPH Low Fraction - on All GAS contam. Samples (G,1-3, + Gas Tar Spl's
TPH High Fraction - on All; WOT, DT, HFT + All Comp. Sample

Surcharge (if any) _____

Method of Shipment (circle one): Hand Deliv. US Mail UPS Fed Exp Bus WTG Courier _____

Collector's Name (Print) _____ Collector's Signature _____

SHIPMENT

Relinquished by Don Wells Date 6 / 21/90 Time 8 : 50 ~~AM~~ PM

Received by _____ Date ___/___/90 Time ___:___ AM PM

Relinquished by _____ Date ___/___/90 Time ___:___ AM PM

Received by _____ Date ___/___/90 Time ___:___ AM PM

Temperature of Sample _____

SAMPLE RECEIVING

Received From _____ Condition of Sample _____

Received By _____ Date: ___/___/90 Time ___:___ AM PM

Temperature of Sample _____ Storage of Sample _____

UST SITE INVESTIGATION SUMMARY REPORT (DO NOT Write On This Page)

(Attach Written Report and Sketch to this form)

I. Written Report Must Indicate:

a. probable source(s) of contamination
b. field screening methods used
c. tabulated results of field screening, including sample depths and types of sample (soil, groundwater, surface water)
d. facility status: active or inactive?
e. copy of chain of custody
f. copy of lab report (including TPH plus other analysis required by Soil Remediation Guidelines)
g. quantity of soil excavated (was all contaminated soil removed ?)
h. method of temporary storage or disposal of soil

II. Sketch Must Indicate:

a. North arrow
b. adjacent streets, roads, highways with names and numbers
c. sewer lines and other conduits
d. tank(s), dispenser(s), and if applicable line locations
e. boring locations properly identified (i.e. B-1, B-2___)
f. groundwater flow direction (when indicated by surface features such as streams or springs; or if available from previous investigative work)
g. distance to public water supply well(s)
h. distance to private water supply well(s)
i. distance to surface waters

Asheville Regional Office
59 Woodfin Place
Asheville, N.C. 28801
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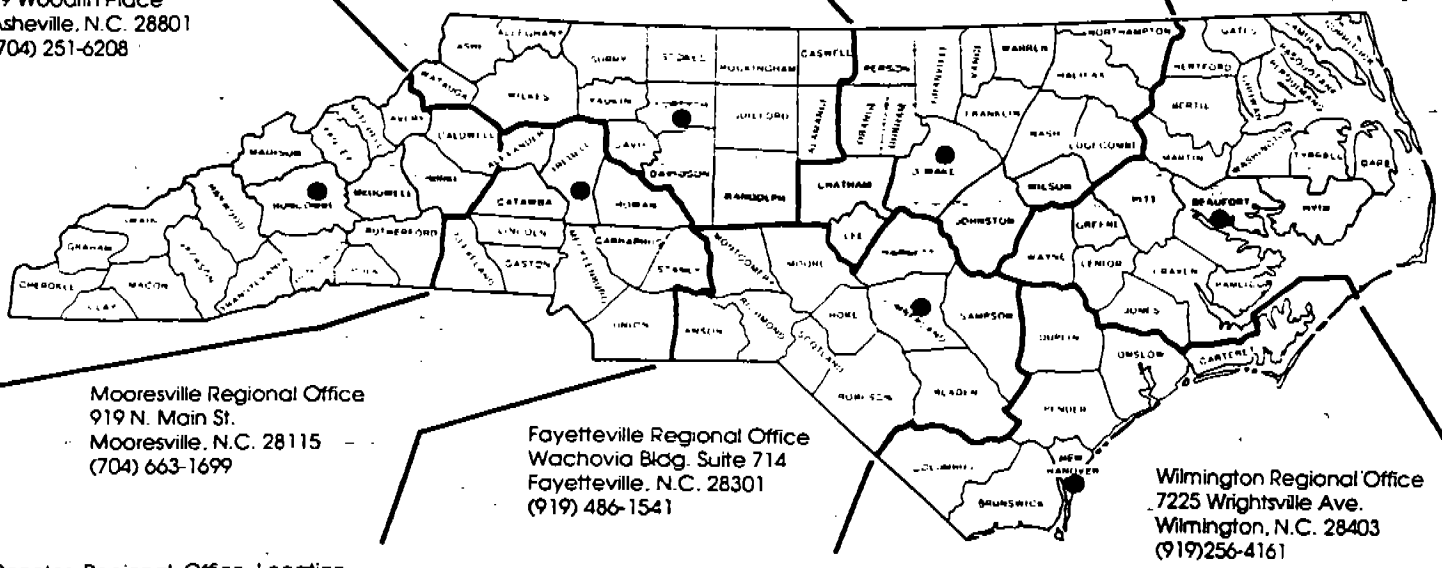
8025 North Point Blvd.
Winston-Salem, N.C. 27106
(919) 761-2351

Raleigh Regional Office
3800 Barrett Dr.
Raleigh, N.C. 27609
(919) 733-2314

Washington Regional Office
1424 Carolina Ave.
Washington, N.C. 27889
(919)946-6481



Mooresville Regional Office
919 N. Main St.
Mooresville, N.C. 28115
(704) 663-1699

Fayetteville Regional Office
Wachovia Bldg. Suite 714
Fayetteville, N.C. 28301
(919) 486-1541

Wilmington Regional Office
7225 Wrightsville Ave.
Wilmington, N.C. 28403
(919)256-4161

◗ Denotes Regional Office Location

North Carolina Department of Environment, Health & Natural Resources
Division of Environmental Management

12/90

Groundwater Section

Figure 2

Site Sensitivity Evaluation (SSE)

Guidelines for Remediation of Soil Contaminated by Petroleum
North Carolina Division of Environmental Management

Characteristic	Condition	Rating	
Soil pH	pH<5.0 or pH >9.0	4	
	8.0 < pH <9.0	2	
	5.0 ≤ pH <6.0	2	
	6.0 ≤ pH ≤8.0	0	4
Grain Size* Udden-Wentworth Scale	Contains >2/3, Gravel to Coarse Sand, (>1/2mm)	10	
	Contains >2/3, Medium to Fine Sand (<1/2mm - 1/8mm)	7	
	Contains >2/3, Very Fine Sand to Coarse Silt (<1/8mm - 1/32mm)	4	
	Contains >2/3, Medium Silt and Clay (<1/32mm)	0	4
Are Relict Structures, Sedimentary Structures, and/or Textures present in the zone of contamination & underlying "soils"	Present and Intersecting the Seasonal High Water Table	10	
	Present but not Intersecting the Seasonal High Water Table	5	
	None Present	0	0
Contaminant Class	I Low to Medium Boiling Point Hydrocarbons [C1-C15] and "some military jet fuels"	10	
	II High Boiling Hydrocarbons [C12-C20] and "other jet fuels"	5	5
Distance from Location of Deepest Contaminated Soil (>10 ppm TPH) to Seasonal High Water Table	5 - 10 feeet	10	
	>10-40	5	
	>40 feet	0	5
Is the Top of Bedrock located above the Seasonal Low Water Table ?	Yes	5	
	No	0	0
Is a Confining Layer present between bottom of contaminated soil and water table ?	No	5	
	Yes	0	5
Time since release of contaminant has occurred	>1 yr. or unknown	10	
	6 months-1 year	5	
	<6 months	0	10
Artifical Conduits present within the zone of contamination	Present & Intersecting the Seasonal High Water Table	10	
	Present but not intersecting the Seasonal High Water Table	5	
	Not Present	0	0

* Figure 3

TOTAL SCORE 33